GEI Consultants

Consulting Engineers and Scientists

November 9, 2018
Project 04516-3

Bureau of Waste Site Cleanup
Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

Dear Sir or Madam:

Re: Release Abatement Measure Status Report No. 1
50 Tufts Street
Somerville, Massachusetts
MassDEP RTN 3-23246

On behalf of Somerville Community Corporation (SCC) of Somerville, Massachusetts, GEI Consultants, Inc. (GEI) is submitting this Release Abatement Measure (RAM) Status Report for response actions associated with the renovation of a Veterans of Foreign Wars (VFW) hall into a residential apartment building at 163 Glen Street in Somerville, Massachusetts (the Property; Fig. 1). Response actions include installation of an Exposure Pathway Mitigation Measure (EPMM) consisting of a vapor barrier and a sub-slab ventilation piping network (piping network) beneath the building, and management of potentially contaminated soil. During construction, appropriate electrical and telephone hookups also will be installed to provide connections to a radon-type fan and remote telemetric system, if needed, based on the results of post-construction confirmatory indoor air testing. The building renovation and associated response actions under this RAM Plan are being conducted by SCC, the current property owner.

The Property is located on a portion of the Massachusetts Department of Environmental Protection (MassDEP)-listed disposal site identified as 50 Tufts Street and assigned Release Tracking Number (RTN) 3-23246 (the Site; Fig. 2). This RAM Status Report was prepared in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.0440). The scope of RAM activities at the property is consistent with the Phase IV remedial action for the disposal site.

The MassDEP RAM Transmittal Form (BWSC106) is being submitted electronically via eDEP, and a copy is in Appendix A. GEI will provide copies of this RAM Plan to the local public document repositories that were established for the Site at the Somerville Central Public Library and at the City of Somerville Clerk's Office. GEI will also provide an electronic version of this report to the City for posting to the City's web site.

GEI Consultants, Inc.
400 Unicorn Park Drive, Woburn, MA 01801
781.721.4000 fax: 781.721.4073

1. Contact Information

Responsibility for the RAM
Daniel LeBlanc
CEO
Somerville Community Corporation
337 Somerville, Avenue
Somerville, MA 02143
617-776-5931

Licensed Site Professional (LSP) for the RAM
Ileen S. Gladstone, P.E., LSP, LEED AP
Senior Vice President
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781-721-4012
LSP License No. 9719

2. Description of Release, Site Conditions, and Surrounding Receptors

2.1 Site Description

A release of chlorinated volatile organic compounds (VOCs) to soil and groundwater on the 50 Tufts Street property was first reported to MassDEP in 2002. Numerous studies have been conducted at the Site, and response actions are currently being conducted as part of Phase V of the MCP process. Chlorinated VOCs generally have not been detected in soil beyond the limits of the 50 Tufts Street property. Chlorinated VOCs have been detected in groundwater beyond the 50 Tufts Street property boundaries. Through studies conducted at the Site, the extent of dissolved concentrations of chlorinated VOCs in groundwater has been determined, and the Site boundary has been delineated. A portion of the Property is located within the boundaries of the Site (Fig. 2).

The Property is located approximately 150 feet northeast of the 50 Tufts Street property. It is located within a commercial/residential zoning district and fronts residential property to the north and east, Glen Street to the south, and a parking lot to the west. The Property building is currently being renovated into residential housing. Prior to renovation, the Property was occupied by an American Legion Post.

2.2 Surrounding Receptors

The area surrounding the Site includes residential and commercial properties. We have not identified any sensitive environmental receptors within 500 feet of the Site. The Site is not located within a MassDEP-approved Wellhead Protection Area (Zone II Area), MassDEP Interim Wellhead Protection Area, or potentially productive aquifer (PPA), and no public water supplies or private drinking water wells are located within 1 mile of the Site. There is one Protected Open Space Area within 500 feet of the Property (Capuano Center). The closest surface water bodies are the Mystic River, located approximately 1-mile northeast of the Property, and the Charles River, located approximately 1.7 miles south-southeast of the Property.

3. RAM Objectives, Plan, and Schedule (310 CMR 40.0444[1][c])

3.1 Objectives

The objectives of the RAM were to address the following:

- Construction of the proposed residential apartment building, including installation of a vapor barrier and piping network.
- Management of potentially contaminated soil excavated during construction.
- Confirmatory sub-slab soil vapor and indoor air testing following the substantial completion of building construction.

3.2 Project Description

Site redevelopment is on-going and includes renovation of the existing American Legion Post into a residential apartment building. The soil excavation and building construction were performed by SCC, the current property owner. Excavated soil has been reused on-site to raise the elevation of the building foundation slab, and there was no excess soil to transport. The total area of disturbance is approximately 5,000 square feet (ft^2). Most of the existing building foundation will be maintained as part of renovation. A vapor barrier and sub-slab ventilation piping network was installed beneath the building foundation during construction. Construction has been managed to not intercept the water table, and dewatering was not necessary. A schematic of the sub-slab ventilation piping and design drawing for the EPMM are included as Appendix B.

GEI is awaiting substantial completion of the interior building renovation (i.e., framing interior rooms and walls, completing floor finishes) to perform sub-slab soil vapor sampling to evaluate post-construction sub-slab soil vapor conditions. We will also perform confirmatory indoor air testing following completion of interior building renovation to evaluate the effectiveness of the vapor intrusion mitigation measures already instituted and confirm whether concentrations in indoor air constitute a condition of No Significant Risk (NSR) to building occupants.

If the soil vapor and indoor air testing demonstrates that the vapor intrusion mitigation measures are effective, we will submit a RAM Completion Report. Additional rounds of confirmatory indoor air testing will be conducted in subsequent calendar quarters as part of Phase V activities for the 50 Tufts Street Site. The sub-slab soil vapor and indoor air sampling results will also support an evaluation of whether the passive EPMM is necessary to maintain a condition of NSR to building occupants, and to evaluate the need for an Activity and Use Limitation (AUL) to maintain the EPMM.

4. Limitations

This RAM Plan was prepared for the use of SCC and UniFirst. The conclusions presented in this report are based solely on the information contained or referenced in this report. Additional quantitative information regarding the Site that was not available to us may result in a modification of the findings above. The report has been prepared in accordance with generally accepted geohydrological practices. No warranty, expressed or implied, is made.

Please contact me at 781-721-4012 or igladstone@geiconsultants.com, or Joseph Roman at 781-721-4136 or jroman@geiconsultants.com if you have any questions.

Sincerely,

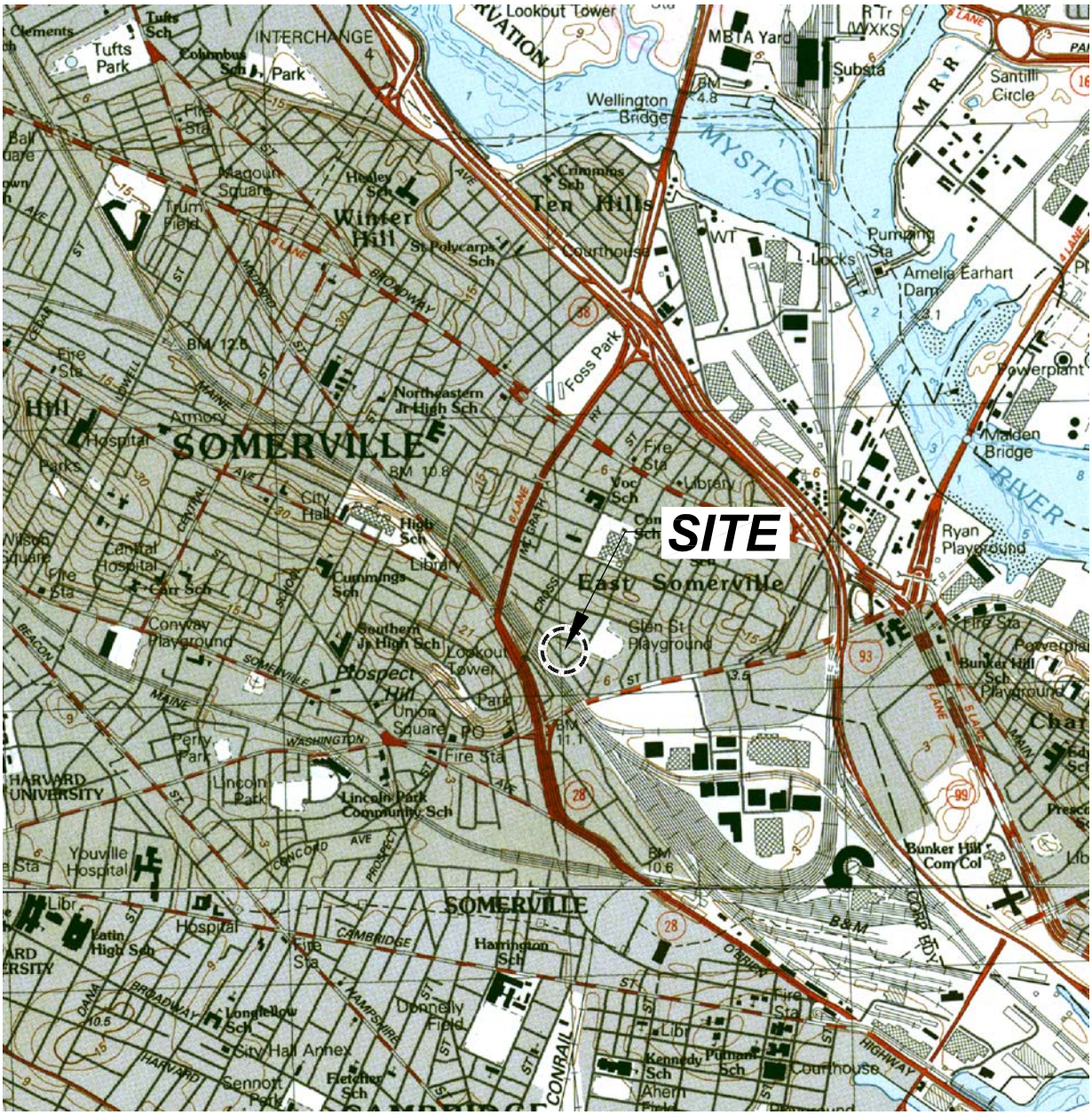
GEI CONSULTANTS, INC.

Ileen S. Gladstone, P.E., LSP, LEED AP
Senior Vice President

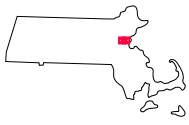
Joseph D. Roman, LSP
Senior Project Manager

JDR
Enclosures
c: Scott Hayman, SCC
Timothy Cosgrave, UniFirst Corporation
N:\04516\15.0 Report Original\15.125 RAM Status 163 Glen Street\163 Glen RAM Status Report 1.docx

Figures



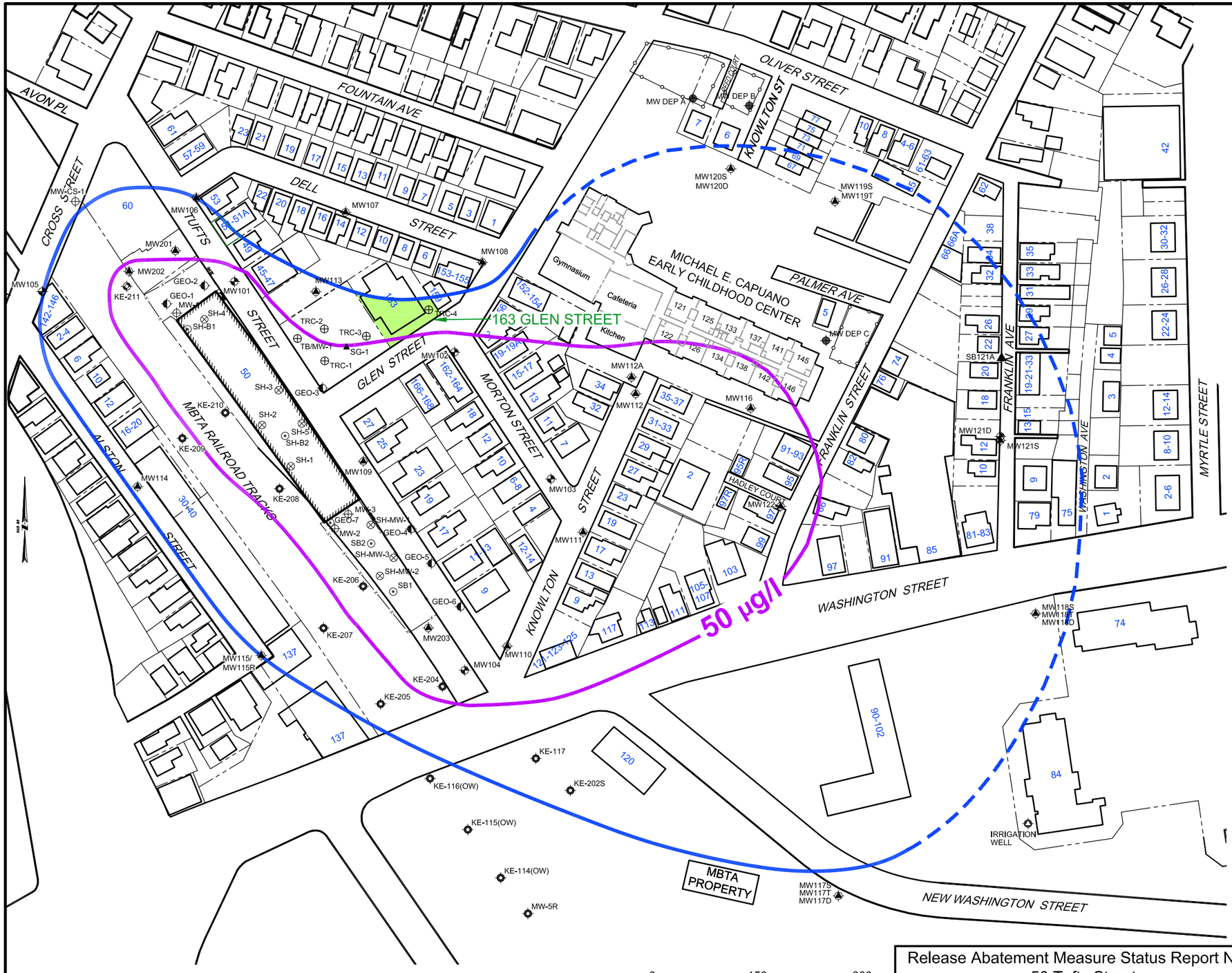
This Image provided by MassGIS is from U.S.G.S.
Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum of 1929 (NGVD29).
Contour Interval is 3 Meters.



MASSACHUSETTS
QUADRANGLE LOCATION

Release Abatement Measure Status Report No. 1 50 Tufts Street Somerville, Massachusetts	GEI Consultants	SITE LOCATION MAP
UniFirst Corporation Wilmington, Massachusetts	Project 04516-3	November 2018 Fig. 1

N:\04516\#Drafting\04516-3\RAM\045163 RAM slm



LEGEND:

- MONITORING WELL INSTALLED BY TRC, 2014
- SOIL GAS SAMPLING POINT BY TRC, 2014
- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL BY KLEINFELDER, SEPTEMBER 2012, MARCH 2014, AND APRIL 2014
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- 84 STREET ADDRESS
- MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- EXTENT OF PCE CONCENTRATION IN SHALLOW GROUNDWATER GREATER THAN OR EQUAL TO 50 MICROGRAMS PER LITER (µg/l)
- µg/l = MICROGRAMS PER LITER
- PORTION OF SITE SUBJECT TO THE RAM

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS WERE ESTABLISHED BASED ON THE GROUND SURVEYS BY BSC GROUP, INC.
4. GEI OBSERVED ABANDONMENT OF SH-MW1 AND SH-1 THROUGH SH-5 IN 2007.

Release Abatement Measure Status Report No. 1
50 Tufts Street
Somerville, Massachusetts

UniFirst Corporation
Wilmington, Massachusetts

GEI Consultants

163 Glen Street
Portion of Disposal Site
Subject to RAM

Project 04516-3 | November 2018 | Fig. 2

N:\04516\#Drafting\04516-3\RAM\045160-3 RAM 163 Glen Street

Appendix A

MassDEP Transmittal Form

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC 106 12

Release Tracking Number
3 - 23246

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

A. SITE LOCATION:

1. Site Name/Location Aid: 50 TUFTS ST & PROP ACROSS THE ST
2. Street Address: 50 TUFTS ST
3. City/Town: SOMERVILLE 4. Zip Code: 021454129

☑ 5. Check here if the disposal site that is the source of the release is Tier Classified. Check the current Tier Classification Category.

☐ a. Tier I ☐ b. Tier ID ☑ c. Tier II

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of Initial RAM Plan (if previously submitted): 6/28/2018 (mm/dd/yyyy)

☐ 2. Submit an **Initial Release Abatement Measure (RAM) Plan**.

☐ a. Check here if the RAM is being conducted as part of the construction of a permanent structure. If checked, you must specify what type of permanent structure is to be erected in or in the immediate vicinity of the area where the RAM is to be conducted.

b. Specify type of permanent structure: (check all that apply) ☐ i. School ☐ ii. Residential ☐ iii. Commercial ☐ iv. Industrial ☐ v. Other Specify: _____

☐ 3. Submit a **Modified RAM Plan** of a previously submitted RAM Plan.

☑ 4. Submit a **RAM Status Report**.

☐ 5. Submit a **Remedial Monitoring Report**. (This report can only be submitted through eDEP, concurrent with a RAM Status Report.)

a. Type of Report: (check one) ☐ i. Initial Report ☐ ii. Interim Report ☐ iii. Final Report

b. Frequency of Submittal:

☐ i. A Remedial Monitoring Report(s) submitted every six months, concurrent with a RAM Status Report.
☐ ii. A Remedial Monitoring Report(s) submitted annually, concurrent with a RAM Status Report.

c. Number of Remedial Systems and/or Monitoring Programs: _____

A separate BWSC106A, RAM Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.

☐ 6. Submit a **RAM Completion Statement**.

☐ 7. Submit a **Revised RAM Completion Statement**.

8. Provide Additional RTNs:

☐ a. Check here if this RAM Submittal covers additional Release Tracking Numbers (RTNs). RTNs that have been previously linked to a Primary Tier Classified RTN do not need to be listed here. This section is intended to allow a RAM to cover more than one unclassified RTN and not show permanent linkage to a Primary Tier Classified RTN.

b. Provide the additional Release Tracking Number(s) covered by this RAM Submittal. ☐ - ☐ ☐ - ☐

☐ 9. Include in the **RAM Plan** or **Modified RAM Plan** a **Plan for the Application of Remedial Additives** near a sensitive receptor, pursuant to 310 CMR 40.0046(3).

(All sections of this transmittal form must be filled out unless otherwise noted above)

C. RELEASE OR THREAT OF RELEASE CONDITIONS THAT WARRANT RAM:

1. Media Impacted and Receptors Affected: (check all that apply)

☐ a. Paved Surface ☐ b. Basement ☐ c. School
☐ d. Public Water Supply ☐ e. Surface Water ☐ f. Zone 2 ☐ g. Private Well ☑ h. Residence ☐ i. Soil
☑ j. Ground Water ☐ k. Sediments ☐ l. Wetland ☐ m. Storm Drain ☑ n. Indoor Air ☐ o. Air
☐ p. Soil Gas ☑ q. Sub-Slab Soil Gas ☐ r. Critical Exposure Pathway ☐ s. NAPL ☐ t. Unknown
☐ u. Others Specify: _____

2. Sources of the Release or TOR: (check all that apply)

☐ a. Transformer ☐ b. Fuel Tank ☑ c. Pipe
☐ d. OHM Delivery ☐ e. AST ☑ f. Drums ☐ g. Tanker Truck ☑ h. Hose ☐ i. Line
☐ j. UST Describe: _____ ☐ k. Vehicle ☐ l. Boat/Vessel
☐ m. Unknown ☐ n. Other: _____

3. Type of Release or TOR: (check all that apply)

☐ a. Dumping ☐ b. Fire ☐ c. AST Removal ☐ d. Overfill
☐ e. Rupture ☐ f. Vehicle Accident ☐ g. Leak ☑ h. Spill ☐ i. Test Failure ☐ j. TOR Only
☐ k. UST Removal Describe: _____
☐ l. Unknown ☐ m. Other: _____

4. Identify Oils and Hazardous Materials Released: (check all that apply)

☐ a. Oils ☑ b. Chlorinated Solvents
☐ c. Heavy Metals ☐ d. Others Specify:

D. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply, for volumes list cumulative amounts)

☐ 1. Assessment and/or Monitoring Only
☐ 2. Temporary Covers or Caps
☐ 3. Deployment of Absorbent or Containment Materials
☐ 4. Temporary Water Supplies
☑ 5. Structure Venting System/HVAC Modification System
☐ 6. Temporary Evacuation or Relocation of Residents
☐ 7. Product or NAPL Recovery
☐ 8. Fencing and Sign Posting
☐ 9. Groundwater Treatment Systems
☐ 10. Soil Vapor Extraction
☐ 11. Remedial Additives
☐ 12. Air Sparging
☐ 13. Active Exposure Pathway Mitigation System
☐ 14. Passive Exposure Pathway Mitigation System
☐ 15. Monitored Natural Attenuation
☐ 16. In-Situ Chemical Oxidation

D. DESCRIPTION OF RESPONSE ACTIONS (cont.): (check all that apply, for volumes list cumulative amounts)

☐ 17. Excavation of Contaminated Soils

☐ a. Re-use, Recycling or Treatment ☐ i. On Site Estimated volume in cubic yards _____

☐ ii. Off Site Estimated volume in cubic yards _____

iia. Receiving Facility: _____ Town: _____ State: ____

iib. Receiving Facility: _____ Town: _____ State: ____

iii. Describe:

☐ b. Store ☐ i. On Site Estimated volume in cubic yards _____

☐ ii. Off Site Estimated volume in cubic yards _____

iia. Receiving Facility: _____ Town: _____ State: ____

iib. Receiving Facility: _____ Town: _____ State: ____

☐ c. Landfill ☐ i. Cover Estimated volume in cubic yards _____

Receiving Facility: _____ Town: _____ State: ____

☐ ii. Disposal Estimated volume in cubic yards _____

Receiving Facility: _____ Town: _____ State: ____

☐ 18. Removal of Drums, Tanks or Containers:

a. Describe Quantity and Amount:

b. Receiving Facility: _____ Town: _____ State: ____

c. Receiving Facility: _____ Town: _____ State: ____

☐ 19. Removal of Other Contaminated Media:

a. Specify Type and Volume:

b. Receiving Facility: _____ Town: _____ State: ____

c. Receiving Facility: _____ Town: _____ State: ____

☐ 20. Other Response Actions:

Describe:

☐ 21. Use of Innovative Technologies:

Describe:

E. LSP SIGNATURE AND STAMP :

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> if Section B of this form indicates that a **Release Abatement Measure Plan** is being submitted, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that a **Release Abatement Measure Status Report** and/or **Remedial Monitoring Report** is being submitted, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply (ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that a **Release Abatement Measure Completion Statement** is being submitted, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal:

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP #:	9719				
2. First Name:	ILEEN S	3. Last Name:	GLADSTONE		
4. Telephone:	7817214012	5. Ext.:		6. Email:	igladstone@geiconsultan
7. Signature:					
8. Date:	(mm/dd/yyyy)	9. LSP Stamp:			

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM
Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

F. PERSON UNDERTAKING RAM:

1. Check all that apply: ☐ a. change in contact name ☐ b. change of address ☑ c. change in the person undertaking response actions

2. Name of Organization: SOMERVILLE COMMUNITY CORPORATION

3. Contact First Name: DANIEL 4. Last Name: LEBLANC

5. Street: 337 SOMERVILLE AVENUE 6. Title: CEO

7. City/Town: SOMERVILLE 8. State: MA 9. ZIP Code: 021430000

10. Telephone: 6177765931 11. Ext.: 12. Email:

G. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON UNDERTAKING RAM:

☑ Check here to change relationship

☑ 1. RP or PRP ☑ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter

☐ e. Other RP or PRP Specify:

☐ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ 4. Any Other Person Undertaking RAM Specify Relationship:

H. REQUIRED ATTACHMENT AND SUBMITTALS:

☐ 1. Check here if any Remediation Waste, generated as a result of this RAM, will be stored, treated, managed, recycled or reused at the site following submission of the RAM Completion Statement. You must submit a Phase IV Remedy Implementation Plan along with the appropriate transmittal form (BWSC108).

☐ 2. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

☑ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the implementation of a Release Abatement Measure.

☐ 4. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to bwsc.edep@state.ma.us.

☐ 5. If a RAM Compliance Fee is required for this RAM, check here to certify that a RAM Compliance Fee was submitted to DEP, P. O. Box 4062, Boston, MA 02211.

☑ 6. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

I. CERTIFICATION OF PERSON UNDERTAKING RAM:

1. I, _____ , attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By: _____ 3. Title: CEO

(Signature)

4. For: SOMERVILLE COMMUNITY CORPORATION 5. Date: _____

(Name of person or entity recorded in Section F) (mm/dd/yyyy)

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section F.

7. Street: _____

8. City/Town: _____ 9. State: _____ 10. ZIP Code: _____

11. Telephone: _____ 12. Ext.: _____ 13. Email: _____

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO $10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE

Date Stamp (DEP USE ONLY:)

Appendix B

EPMM Drawings

GENERAL:

1. THE SUBSLAB VENTING SYSTEM SHALL CONSIST OF A MINIMUM 60-MIL SPRAY-ON ASPHALT EMULSION TYPE GEOMEMBRANE VAPOR BARRIER, SUCH AS LAND SCIENCE TECHNOLOGIES GEO-SEAL® VAPOR INTRUSION BARRIER, OR APPROVED EQUIVALENT, PLACED DIRECTLY BELOW THE CONCRETE SLAB AND OVERLYING A MINIMUM OF 9 INCHES OF 3/4-INCH CRUSHED STONE WITHIN WHICH A PERFORATED POLYVINYLCHLORIDE (PVC) PIPE NETWORK IS TO BE INSTALLED. BENEATH THE CRUSHED STONE LAYER, A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED OVER THE SUBGRADE.
2. THE CRUSHED STONE SHALL MEET THE GRADATION REQUIREMENTS OF THE MASSDOT M2.01.3:

SQUARE OPENING SIEVE	PERCENT BY WEIGHT PASSING THROUGH
37.5 MM	100
31.5 MM	85-100
19 MM	10-40
12.5 MM	0-8

3. THE CRUSHED STONE SHALL BE COMPACTED IN ACCORDANCE WITH THE PROJECT EARTHWORK SPECIFICATIONS (BY OTHERS).
4. AFTER FIRST CONNECTING THE PIPE AND CHECKING FOR GRADE ALIGNMENT, HAUNCHING MATERIAL AT THE UNDERSIDE OF THE PIPE (5 O'CLOCK AND 7 O'CLOCK LOCATIONS) SHOULD BE UNIFORMLY PLACED AND TAMPED TO THE REQUIRED COMPACTED DENSITY BEFORE PLACING THE REMAINDER OF THE EMBEDMENT MATERIALS.
5. POST INSTALLATION QUALITY CONTROL (QC) SHALL BE PERFORMED BY THE CONTRACTOR IN THE PRESENCE OF THE ENGINEER.
6. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND INCIDENTALS, AND PERFORM ALL OPERATIONS NECESSARY TO FURNISH, DEPLOY, SEAM AND QC TEST THE SUBSLAB VENT SYSTEM AND GEOMEMBRANE INCLUDING LEAK DETECTION TESTING.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING A QC TESTING PROGRAM MEETING, AS A MINIMUM, THE REQUIREMENTS SPECIFIED BY THE MANUFACTURER AND FURTHER SPECIFIED HEREIN, AND COORDINATING QC PROCEDURES WITH THE OWNER'S ENGINEER TO ASSURE THAT MATERIALS AND INSTALLATION METHODS EMPLOYED ARE OF A QUALITY SUITABLE FOR USE IN A CHEMICAL VAPOR BARRIER APPLICATION.

SUBMITTALS:

1. SUBMITTALS SHALL BE PREPARED AND SIGNED BY A MANUFACTURER APPROVED INSTALLER EXPERIENCED WITH THE GEOMEMBRANE VAPOR BARRIER PROPOSED FOR USE.

GEOMEMBRANE VAPOR BARRIER AND INDOOR AIR QUALITY ASSURANCE:

1. VAPOR BARRIER INSTALLATION SHALL BE PERFORMED BY AN INSTALLER TRAINED AND APPROVED BY THE MANUFACTURER OF THE SELECTED GEOMEMBRANE VAPOR BARRIER SYSTEM.
2. VAPOR BARRIER INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
3. DRAWINGS INDICATING ANY PROPOSED MODIFICATIONS TO SYSTEM PIPING MUST BE SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
4. POST-INSTALLATION DESTRUCTIVE TESTING OF THE GEOMEMBRANE VAPOR BARRIER SHALL BE PERFORMED AT A MINIMUM FREQUENCY OF 1 PER 1000 SQUARE FEET BY CUTTING A MAXIMUM AREA OF 2 SQUARE INCHES AND MEASURING THE THICKNESS OF THE SAMPLE WITH A MIL-READING CALIPER. DEDUCT THE THICKNESS OF THE PLAIN GEOTEXTILE FABRIC TO DETERMINE THE THICKNESS OF THE SPRAY-ON EMULSION APPLIED MEMBRANE. ALL DESTRUCTIVE TESTING AREAS SHALL BE REPAIRED BEFORE BUILDING CONSTRUCTION.
5. POST-INSTALLATION LEAK DETECTION TESTING SHALL BE PERFORMED AS RECOMMENDED BY MANUFACTURER.

PIPING AND SUB-SLAB DEPRESSURIZATION QUALITY ASSURANCE:

1. THE SUB-SLAB PIPE NETWORK AND SURROUNDING CRUSHED STONE ARE NOT DESIGNED TO SUPPORT ANY LOADING FROM THE CONCRETE SLAB.
2. STANDARD PVC T-FITTINGS OR EQUIVALENT SHALL BE USED TO CONNECT LATERAL PIPES TO HEADER PIPE AND TO CONNECT HEADER PIPE TO RISER.
3. PIPE NETWORK HEADER PIPES SHALL BE 4-INCH DIAMETER PVC PIPE CONFORMING TO ASTM D 1785, SCHEDULE 80.
4. PIPE NETWORK LATERAL PIPES SHALL BE STANDARD PERFORATED PVC CONFORMING TO ASTM D 2729.
5. PIPE NETWORK LATERAL PIPES SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 15 FEET BETWEEN ADJACENT PIPES. CONTRACTOR SHALL ENSURE THAT PIPE SPACING DISTANCE SELECTED WILL ALLOW FOR ACHIEVEMENT OF A NEGATIVE PRESSURE FIELD BENEATH THE BUILDING FOUNDATION.
6. PIPE NETWORK LATERAL PIPES SHALL BE INSTALLED IN DEDICATED TRENCHES. SUB-SLAB PLUMBING SHALL BE INSTALLED ABOVE OR BELOW THE LATERAL PIPE TRENCHES AT LOCATIONS WHERE IT CROSS THE LATERAL PIPES.
7. ALL HORIZONTAL PIPES MUST BE INSTALLED AT A MINIMUM SLOPE OF 1/8 INCH PER FOOT BACK TOWARDS SCREENED PVC TO DRAIN CONDENSATE/PRECIPITATION BACK TO THE PERFORATED INTERVAL.
8. ALL VERTICAL VENT PIPING SHALL BE INSTALLED EXTERIOR TO THE BUILDING.
9. THE PIPE NETWORK SHALL MAINTAIN A MINIMUM DISTANCE OF 6 FEET FROM ANY FOUNDATION WALL EXCEPT WHERE SPECIFICALLY NOTED.
10. PIPE NETWORK HEADER PIPES SHALL BE CONNECTED TO LATERAL PIPES AND TO VERTICAL RISER PIPES AND SHALL BE NON-PERFORATED 4-INCH SCHEDULE 80 PVC PIPE. HEADER PIPES SHALL HAVE ¼ INCH DIAMETER CONDENSATE DRAIN HOLES DRILLED AND SPACED 10 FEET APART, ORIENTED FACING DOWNWARD.
11. VERTICAL VENT RISER PIPES SHALL BE NON-PERFORATED 4-INCH SCHEDULE 80 PVC PIPE.
12. PROVISIONS SHALL BE INCLUDED FOR THE ADDITION OF AN IN-LINE CENTRIFUGAL FAN UNIT ON THE ROOF (SUPPORTED AS NECESSARY) CAPABLE OF INDUCING 0 TO 4 INCHES OF WATER VACUUM WHILE MOVING 50 TO 300 CUBIC FEET PER MINUTE OF AIR IN THE EVENT THAT VAPOR INTRUSION FROM THE SUBSURFACE CAUSES INDOOR AIR QUALITY DO NOT CONFORM TO FEDERAL, STATE AND LOCAL STANDARDS UNDER PASSIVE OPERATION OF THE SUB-SLAB VENTILATION SYSTEM.
13. RISER TERMINATIONS SHALL BE LOCATED DOWNWIND FROM AND A MINIMUM DISTANCE OF 10 FEET FROM ANY AIR INTAKE TO THE BUILDING, OPERABLE ROOF WINDOW OR ADJACENT BUILDING AND BE 10 FEET ABOVE GRADE.
14. RISER TERMINATIONS SHALL EXTEND A MINIMUM OF 2 FEET ABOVE THE ROOF LINE.
15. SAMPLE PORTS CAPABLE OF MEASURING SUB-SLAB VACUUM WILL BE INSTALLED IN THE CONCRETE SLAB IN THE LOCATIONS SHOWN ON SHEET C-02.

GEOTEXTILES:

1. GEOTEXTILE FABRIC WILL BE APPLIED TO BARE SOIL WHERE THE EXISTING CONCRETE SLAB IS NOT PRESENT. GEOTEXTILE FABRIC LOCATED ADJACENT TO THE EXISTING CONCRETE SLAB SHALL OVERLAP THE CONCRETE BY A MINIMUM OF 12 INCHES.
2. GEOTEXTILE FABRIC WILL BE APPLIED TO THE BOTTOM AND SIDES OF TRENCHES FOR PIPE NETWORK LATERAL PIPES.
3. GEOTEXTILE FABRIC UNDERLYING GRAVEL SHALL BE NON-WOVEN POLYPROPYLENE FABRIC SUCH AS MIRAFI 140N OR APPROVED EQUIVALENT.
4. GEOTEXTILE FABRIC SHALL BE NON-BIODEGRADABLE.
5. GEOTEXTILE FABRIC SHALL BE INERT TO PETROLEUM HYDROCARBONS.
6. GEOTEXTILE SHALL BE INSTALLED AND HANDLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. WHERE ADJACENT PIECES OF GEOTEXTILE FABRIC ARE NECESSARY, THEY SHALL NOT BE SEWN. ADJACENT PIECES OF GEOTEXTILE FABRIC SHALL OVERLAP BY A MINIMUM OF 12 INCHES.
8. WHERE SHEETS OF GEOTEXTILE ARE OVERLAIN ON SLOPED SURFACES, THEY SHALL BE SHINGLED SO THAT THE UPSLOPE PIECE OVERLIES THE ADJACENT DOWN SLOPE PIECE BY A MINIMUM OF 12 INCHES.
9. ALL HOLES AND RIPS IN GEOTEXTILE FABRIC SHALL BE REPLACED OR REPAIRED BY OVERLAYING ADDITIONAL GEOTEXTILE MATERIAL.

SUBMITTALS:

1. THE MANUFACTURER OF THE GEOMEMBRANE VAPOR BARRIER SYSTEM.
2. SIEVE ANALYSIS AND SOURCE FOR CRUSHED STONE.

NOTES:

1. DETAIL DRAWINGS IN THIS DESIGN SET ARE BASED ON DRAWINGS PROVIDED BY LAND SCIENCE TECHNOLOGIES, INC. AND DAVIS SQUARE ARCHITECTS, INC.
2. PVC PIPE CONNECTIONS BELOW THE FLOOR SLAB SHALL BE SECURED USING A MINIMUM OF TWO STAINLESS STEEL SCREWS OR GLUED JOINTS.
3. PVC PIPE CONNECTIONS ABOVE THE FLOOR SLAB SHALL BE SECURED USING COMPATIBLE SCREWS AND TEFLON THREAD TAPE.
4. GALVANIZED STEEL PIPE CONNECTIONS SHALL BE SECURED USING TEFLON THREAD TAPE.

PROJECT:
163 GLEN STREET
SOMERVILLE, MA
SUBSLAB VENTILATION SYSTEM

TITLE:
SUBSLAB VENTING SYSTEM NOTES

DRAWN BY:	JCM	PROJ. NO.:	228540
CHECKED BY:	JD		
APPROVED BY:	DJG		C-01
DATE:	AUGUST 2017		

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FILE NO.: 163 Glen St - SubSlab Ventilation.dwg

22x24 -- ATTACHED XREF'S -- ATTACHED IMAGES
DRAWING NAME: I:\Projects\216867 - 163 Glen Street Somerville MA\Subslab Ventilation System\163 Glen St - SubSlab Ventilation.dwg — PLOT DATE: November 28, 2017 - 5:07PM — LAYOUT: C-01 NOTES 22X24

LEGEND

- 4-INCH SCH 80 NON-PERFORATED PVC HEADER AND VENT RISER PIPE
- 4-INCH SCH 80 PERFORATED PVC LATERAL PIPE
- VENT RISER LOCATION
- PROPOSED PLUMBING TRENCH
- PROPOSED SOIL GAS MONITORING POINT

NOTES:
1. THE SUBSLAB PIPE NETWORK MAY HAVE TO BE MODIFIED TO AVOID CONFLICTS WITH OTHER UTILITIES.
2. VENT RISER LOCATIONS MAY HAVE TO BE MODIFIED SO AS NOT TO CONFLICT WITH OTHER BUILDING FEATURES.
3. DRAWINGS OF ALL PROPOSED MODIFICATIONS MUST BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
4. TRENCHES WILL BE SAW CUT THROUGH ENTIRE FLOOR AND EXPOSE SUB-SLAB SOIL.
5. VENT PIPES MUST TERMINATE AT LEAST 2' ABOVE THE HIGHEST ROOF LINE AND AT LEAST 10' FROM ANY WINDOW, DOOR, OPERABLE ROOF WINDOW, AIR INTAKE OR ADJACENT BUILDING.
6. PERFORATED SUB-SLAB LATERAL PIPES SHALL BE INSTALLED IN DEDICATED TRENCHES.
7. ALL SUB-SLAB VENT PIPING SHALL HAVE A MINIMUM NUMBER OF VERTICAL GRADE CHANGES. PLUMBING PIPE MAY HAVE TO BE RUN BELOW VENT PIPING AT LOCATIONS WHERE THE VENT AND PLUMBING PIPING CROSS.

0 5 10 15 20

SCALE IN FEET
(APPROXIMATE)

1" = 5'

PROJECT:
163 GLEN STREET
SOMERVILLE, MA
SUBSLAB VENTILATION SYSTEM

TITLE:
SUBSLAB VENTING SYSTEM
PIPE LAYOUT - PLAN VIEW

DRAWN BY:	JCM	PROJ. NO.:	228540
CHECKED BY:	JD		
APPROVED BY:	DJG		C-02
DATE:	AUGUST 2017		

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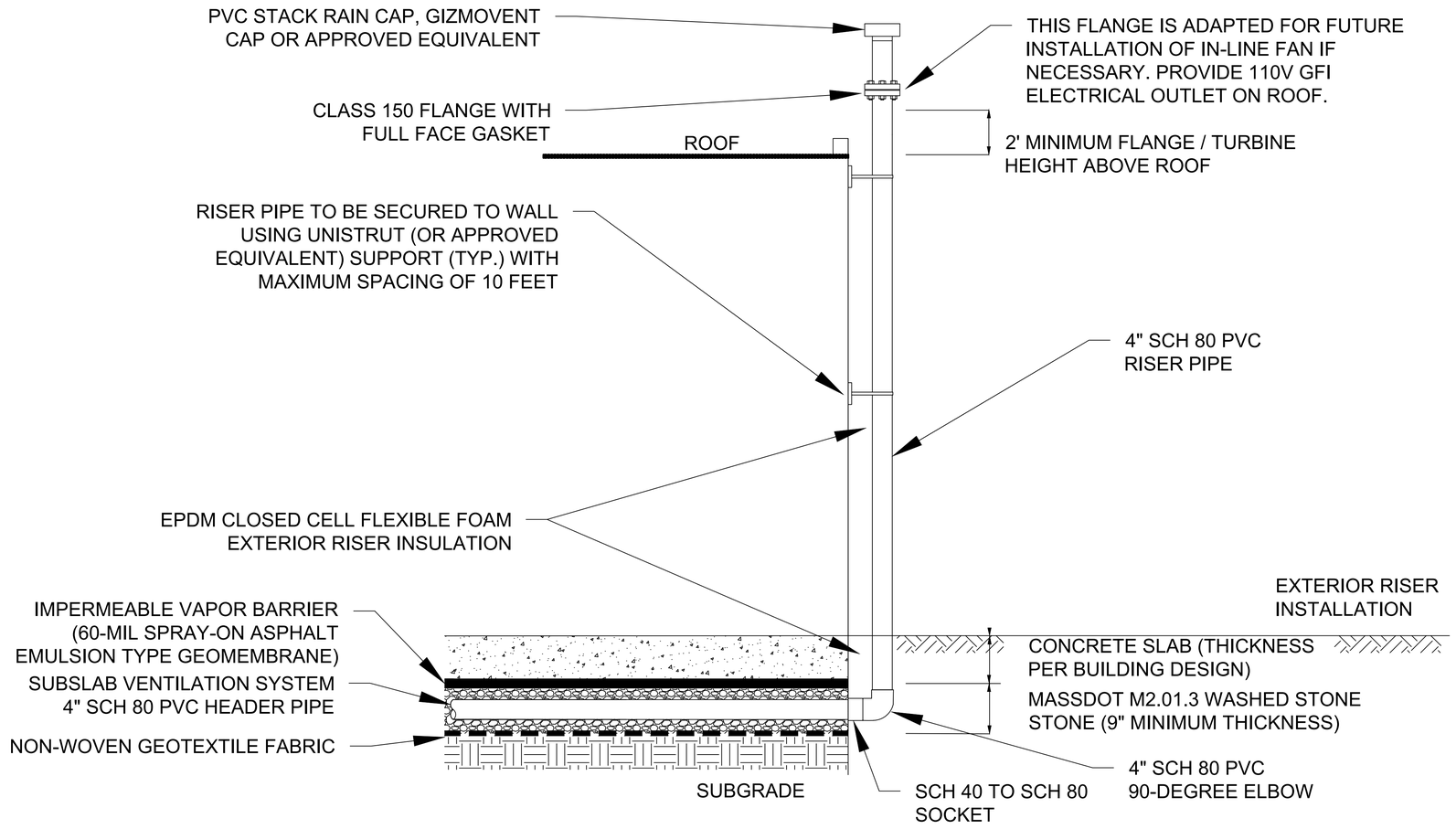
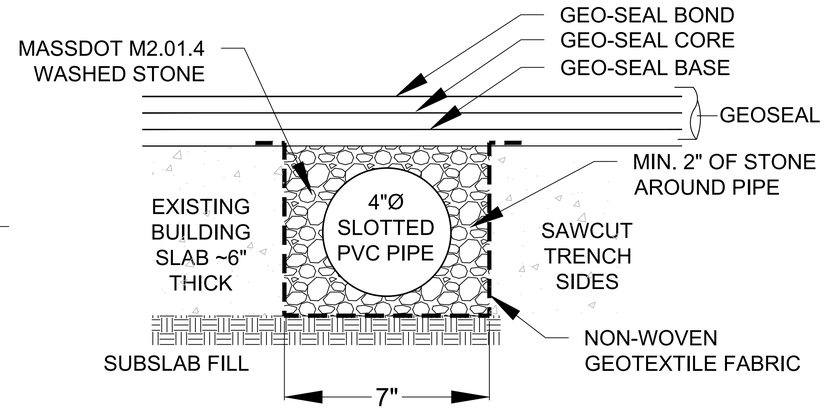
FILE NO.: 163 Glen St - SubSlab Ventilation.dwg

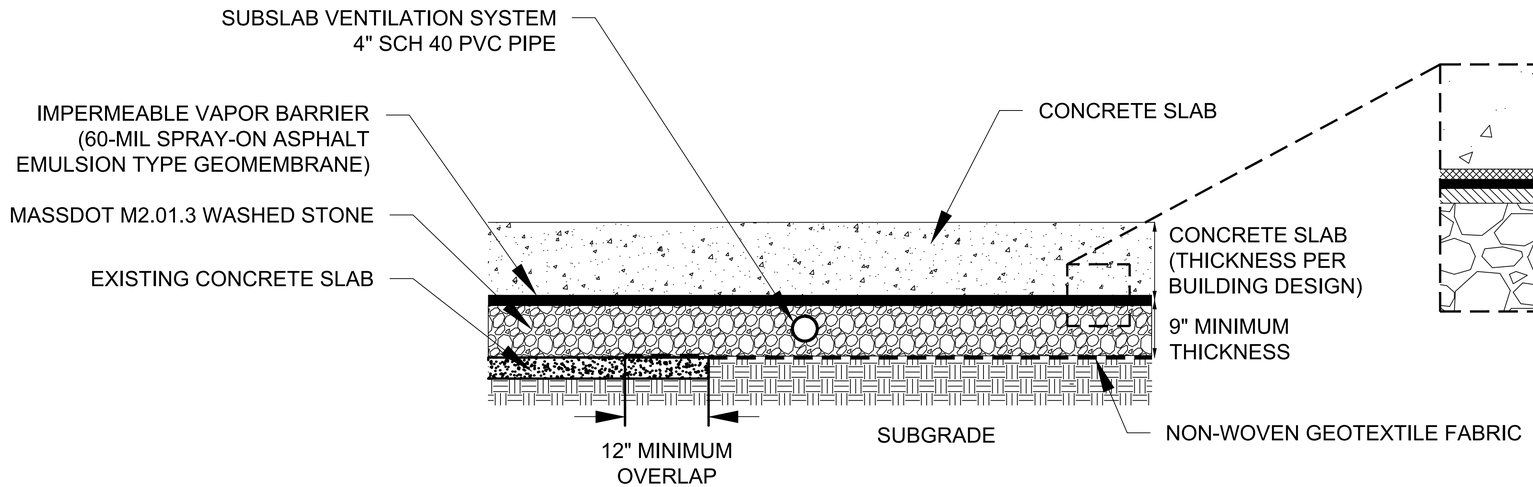
2324 – ATTACHED XREF'S – ATTACHED IMAGES
DRAWING NAME: I:\Projects\216897 - 163 Glen Street Somerville MA\Subslab Ventilation System\ 163 Glen St - SubSlab Ventilation.dwg — PLOT DATE: November 28, 2017 - 4:34PM — LAYOUT: C-02 PLAN VIEW 22X34


PVC STACK RAIN CAP, GIZMOVENT CAP OR APPROVED EQUIVALENT
THIS FLANGE IS ADAPTED FOR FUTURE INSTALLATION OF IN-LINE FAN IF NECESSARY. PROVIDE 110V GFI ELECTRICAL OUTLET ON ROOF.
CLASS 150 FLANGE WITH FULL FACE GASKET
ROOF
2' MINIMUM FLANGE / TURBINE HEIGHT ABOVE ROOF
RISER PIPE TO BE SECURED TO WALL USING UNISTRUT (OR APPROVED EQUIVALENT) SUPPORT (TYP.) WITH MAXIMUM SPACING OF 10 FEET
4" SCH 80 PVC RISER PIPE
EPDM CLOSED CELL FLEXIBLE FOAM EXTERIOR RISER INSULATION
EXTERIOR RISER INSTALLATION
IMPERMEABLE VAPOR BARRIER (60-MIL SPRAY-ON ASPHALT EMULSION TYPE GEOMEMBRANE)
SUBSLAB VENTILATION SYSTEM 4" SCH 80 PVC HEADER PIPE
CONCRETE SLAB (THICKNESS PER BUILDING DESIGN)
MASSDOT M2.01.3 WASHED STONE STONE (9" MINIMUM THICKNESS)
NON-WOVEN GEOTEXTILE FABRIC
4" SCH 80 PVC 90-DEGREE ELBOW
SUBGRADE
SCH 40 TO SCH 80 SOCKET

DETAIL 1 - VERTICAL VENT RISER PIPE DETAIL



DETAIL 3 - TRENCH DETAIL



DETAIL 2 - LATERAL PIPE AND SUBSLAB DETAIL

NOTE: DRAWING NOT TO SCALE.

PROJECT:	**163 GLEN STREET SOMERVILLE, MA SUBSLAB VENTILATION SYSTEM**
TITLE:	**SUBSLAB VENTING SYSTEM DETAILS**
DRAWN BY: JCM	PROJ. NO.: 228540
CHECKED BY: JD	
APPROVED BY: DJG	**C-03**
DATE: AUGUST 2017	

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FILE NO.: 163 Glen St - SubSlab Ventilation.dwg

22x34 -- ATTACHED XREF'S -- ATTACHED IMAGES:
DRAWING NAME: J:\Projects\228540 - 163 Glen Street Somerville MA\Subslab Ventilation System\163 Glen St - SubSlab Ventilation.dwg -- PLOT DATE: November 29, 2017 - 9:42AM -- LAYOUT: C-03 DETAILS 22X34